## We claim:

1. A method to prepare a hybrid modular polyketide synthase (PKS) from individual modules which method comprises

providing at least a first naturally occurring extender module comprising an ACP domain and a second naturally occurring extender module comprising a KS domain which is downstream of the ACP domain in a naturally occurring PKS,

wherein the C-terminus of said ACP domain is covalently linked to the N-terminus of a naturally occurring intrapolypeptide linker (RAL) or interpolypeptide linker (ERL) and the N-terminus of said KS domain is covalently linked to the C-terminus of said RAL or ERL, and

wherein either said first module or second module is not covalently linked to said RAL or ERL in a naturally occurring polyketide synthase.

- 2. A method of preparing a polyketide using the hybrid PKS of claim 1, comprising the steps of preparing a polyketide intermediate using the first module and transferring said intermediate to the second module.
- 3. The method of claim 1, wherein the ACP domain of the first module is from a first PKS and the entire second module is from the same PKS.
- 4. The method of claim 1, wherein the entire first module is from a first PKS and the KS domain of the second module is from the same PKS.
- 5. The method of claim 1, wherein the first and second module each comprise a KS; AT; 0, 1, 2, or 3  $\beta$ ketomodifying ( $\beta$ KM) domains; and an ACP domain wherein the KS and ACP domains are from a first PKS and the AT and  $\beta$ KM domains are from a different PKS.
- 6. A polyketide synthase prepared by the method of claim 1.

7. The PKS of claim 6, wherein said RAL is selected from the group consisting of M2 ery, M4 ery, M6 ery, M2 rif, M3 rif, M5 rif, M3 rap, M4 rap, and M7 rap intrapolypeptide module linkers (SEQ. ID. NO's: 18-26, respectively).

- 8. The PKS of claim 6, wherein the ERL is selected from the group consisting of M3 ery, M5 ery, M4 rif, M7 rif, M8 rif, M9 rif, M5 rap, and M11 rap interpolypeptide linkers (SEQ. ID. NO's: 27-34, respectively).
- 9. The PKS of claim 6, wherein said first module comprises the ACP domain of ery module 4 and said second module comprises the KS domain selected from the group consisting of ery module 5 and 6.
- 10. The PKS of claim 6, wherein said first module comprises the ACP domain of ery module 2 and said second module comprises the KS domain selected from the group consisting of ery module 3 and 5.
- 11. The method of claim 1, wherein the C-terminus of said provided ACP domain is linkerless and then is covalently linked to the N-terminus of a naturally occurring intrapolypeptide linker (RAL) or interpolypeptide linker (ERL).
- 12. A PKS prepared by the method of claim 11.
- 13. The PKS of claim 12, wherein said first module comprises the linkerless ACP domain of *ery* module 4 and said second module comprises the KS domain selected from the group consisting of *ery* module 5 and 6.
- 14. The PKS of claim 12, wherein said first module comprises the linkerless ACP domain of *ery* module 2 and said second module comprises the KS domain from *ery* module 6.
- 15. The PKS of claim 12, wherein the said first module comprises the linkerless ACP domain of *ery* loading didomain (LDD) and said second module comprises the KS domain selected from the group consisting of *ery* module 2 and 6.
- 16. A method to prepare a hybrid modular polyketide synthase (PKS) from individual modules which method comprises

providing at least a first naturally occurring extender module comprising an ACP domain and a second naturally occurring extender module comprising a KS domain which is not normally downstream of the ACP domain in a naturally occurring PKS,

wherein the C-terminus of said ACP domain is covalently linked to the N-terminus of a naturally occurring intrapolypeptide linker (RAL) or interpolypeptide linker (ERL) and the N-terminus of said KS domain is covalently linked to the C-terminus of said RAL or ERL, and

wherein either said first or second module is not covalently linked to said RAL or ERL in a naturally occurring polyketide synthase.

- 17. A method of preparing a polyketide using the hybrid PKS of claim 16, comprising the steps of preparing a polyketide intermediate using the first module and transferring said intermediate to the second module.
- 18. The method of claim 16, wherein the ACP domain of the first module is from a first PKS and the entire second module is from the same PKS.
- 19. The method of claim 16, wherein the entire first module is from a first PKS and the KS domain of the second module is from the same PKS.
- 20. The method of claim 16, wherein the first and second module each comprise a KS; AT; 0, 1, 2, or 3  $\beta$ ketomodifying ( $\beta$ KM) domains; and an ACP domain wherein the KS and ACP domains are from a first PKS and the AT and  $\beta$ KM domains are from a different PKS.
- 21. A PKS prepared by the method of claim 16.
- 22. The PKS of claim 21, wherein said first module comprises the ACP domain of ery module 4 and said second module comprises the KS domain selected from the group consisting of ery module 2 and 3.

23. The method of claim 16, wherein the C-terminus of said provided ACP domain is linkerless and then is covalently linked to the N-terminus of a naturally occurring intrapolypeptide linker (RAL) or interpolypeptide linker (ERL).

- 24. A PKS prepared by the method of claim 23.
- 25. The PKS of claim 24, wherein the said first module comprises the linkerless ACP domain of *ery* module 4 and said second module comprises the KS domain from *ery* module 2.
- 26. The PKS of claim 24, wherein the said first module comprises the linkerless ACP domain of *ery* module 2 and said second module comprises the KS domain from *ery* module 2.
- 27. A method to prepare a hybrid nonribosomal peptide synthetase-modular polyketide synthase (NRPS-PKS) from individual modules which method comprises

providing at least a first naturally occurring extender module comprising a peptidyl carrier protein (PCP) domain from a naturally occurring NRPS and a second naturally occurring extender module comprising a KS domain from a PKS,

wherein the C-terminus of said PCP domain is covalently linked to the N-terminus of a naturally occurring intrapolypeptide linker (RAL) or interpolypeptide linker (ERL) and the N-terminus of the KS domain is covalently linked to the C-terminus of said RAL or ERL, and

wherein either said first or second module is not covalently linked to said RAL or ERL in a naturally occurring NRPS or PKS.

- 28. A method of preparing a peptide-polyketide using the hybrid NRPS-PKS of claim 27, comprising the steps of preparing a peptide intermediate using the first module and transferring said intermediate to the second module.
- A hybrid NRPS-PKS prepared by the method of claim 27.

30. The hybrid NRPS-PKS of claim 29, wherein said RAL is selected from the group consisting of M2 ery, M4 ery, M6 ery, M2 rif, M3 rif, M5 rif, M3 rap, M4 rap, and M7 rap intrapolypeptide linkers (SEQ. ID. NO's: 18-26, respectively).

- 31. The hybrid NRPS-PKS of claim 29, wherein the ERL is selected from the group consisting of M3 ery, M5 ery, M4 rif, M7 rif, M8 rif, M9 rif, M5 rap, and M11 rap interpolypeptide linkers (SEQ. ID. NO's: 27-34, respectively).
- 32. The hybrid NRPS-PKS of claim 29, wherein said first module comprises the PCP domain of NovH and said second module comprises the KS domain selected from the group consisting of *ery* module 2 and 6.